

What is claimed is:

1. A computer implemented method for classifying user-supplied tissue specimens, the method comprising:
  - (A) obtaining tissue specimens for a plurality of tissue types from a subset of a population of subjects with shared characteristics;
  - (B) imaging each of the tissue specimens;
  - (C) determining for each tissue type from the imaging in (B) a distribution of values for calculating an average of each of a plurality of structural indices, wherein the plurality of structural indices includes at least one selected from the group consisting of: cell density, matrix density, blood vessel density, layer thickness, relative cell location, relative matrix location and relative blood vessel location;
  - (D) calculating the average structural indices for the determined distribution of values;
  - (E) calculating dispersion indices for each of the average indices in (D);
  - (F) storing the average of each of a plurality structural indices and dispersion indices in a database;
  - (G) applying steps B-D to measure average structural indices for the user supplied tissue specimens; and
  - (H) classifying each of the user-supplied tissue specimens as either normal or abnormal by comparing the measured structural indices associated with the user-supplied tissue specimens with the corresponding indices stored in the database, wherein the user-supplied tissue specimens are classified as abnormal to the extent that there is a statistically significant deviation of the measured indices from the indices stored in the database,  
wherein the number of tissue specimens in (A) includes a sufficient number of specimens such that the indices correspond to a statistically significant representation of those indices for the population as a whole.
2. The method of claim 1, wherein the at least one is the cell density.
3. The method of claim 1, wherein the at least one is the matrix density.

4. The method of claim 1, wherein the tissue specimens comprise normal tissue.
5. The method of claim 1, wherein the tissue specimens comprise abnormal tissue.
6. The method of claim 1, wherein the tissue specimens comprise normal and abnormal tissue of the same tissue type, and  
wherein in the determination of distribution of values and corresponding index, data from normal tissue is used to determine a distribution of values and a corresponding index for normal tissue and data from abnormal tissue is used to determine a distribution of values and a corresponding index for abnormal tissue.
7. The method of claim 1, wherein the given plurality of tissue types includes at least one type selected from the group consisting of skin, liver, kidney, muscle, brain and pancreas.
8. The method of claim 1, wherein the plurality of structural indices includes at least two selected from the group consisting of: cell density, matrix density, blood vessel density, layer thickness, relative cell location, relative matrix location and relative blood vessel location.
9. The method of claim 8, where the at least two are the cell density and matrix density.
10. The method of claim 8, wherein the tissue specimens comprise normal and abnormal tissue of the same tissue type, and  
wherein in the determination of distribution of values and corresponding index, data from normal tissue is used to determine a distribution of values and a corresponding index for normal tissue and data from abnormal tissue is used to determine a distribution of values and a corresponding index for abnormal tissue.
11. The method of claim 8, wherein the given plurality of tissue types includes at least one type selected from the group consisting of skin, liver, kidney, muscle, brain and pancreas.

12. A computer implemented method for classifying user-supplied tissue specimens, the method comprising:

- (A) obtaining tissue specimens for a plurality of tissue types from a subset of a population of subjects with shared characteristics;
- (B) analyzing each of the tissue specimens;
- (C) determining for each tissue type from the analysis in (B) a distribution of values for calculating an average of each of a plurality of cell function indices, wherein the given plurality of cell function indices includes at least one selected from the group consisting of: location, type and amount of DNA; location, type and amount of mRNA; location, type and amount of cellular proteins; location, type and amount of cellular lipids; and location, type and amount of cellular ion distributions;
- (D) calculating the average cell function indices for the determined distribution of values;
- (E) storing the average cell function indices in a database;
- (F) applying steps B-D to measure average cell function indices for the user supplied tissue specimens; and
- (G) classifying each of the user-supplied tissue specimens as either normal or abnormal by comparing the measured cell function indices associated with the user-supplied tissue specimens with the corresponding cell function indices stored in the database, wherein the user-supplied tissue specimens are classified as abnormal to the extent that there is a statistically significant deviation of the measured cell function indices from the cell function indices stored in the database,

wherein the number of tissue specimens in (A) includes a sufficient number of specimens such that the indices correspond to a statistically significant representation of those indices for the population as a whole.

13. The method of claim 12, wherein the at least one is the location, type and amount of cellular proteins.

14. The method of claim 12, wherein the tissue specimens comprise normal tissue

15. The method of claim 12, wherein the tissue specimens comprise abnormal tissue
16. The method of claim 12, wherein the tissue specimens comprise normal and abnormal tissue of the same tissue type, and  
wherein in the determination of distribution of values and corresponding index, data from normal tissue is used to determine a distribution of values and a corresponding index for normal tissue and data from abnormal tissue is used to determine a distribution of values and a corresponding index for abnormal tissue.
17. The method of claim 12, wherein the given plurality of tissue types includes at least one type selected from the group consisting of skin, liver, kidney, muscle, brain and pancreas.
18. The method of claim 12, wherein the given plurality of cell function indices includes at least two indices selected from the group consisting of: location, type and amount of DNA; location, type and amount of mRNA; location, type and amount of cellular proteins; location, type and amount of cellular lipids; and location, type and amount of cellular ion distributions.
19. The method of claim 18, wherein the at least two are the location, type and amount of DNA, and the location, type and amount of mRNA.
20. The method of claim 18, wherein the tissue specimens comprise normal and abnormal tissue of the same tissue type, and  
wherein in the determination of distribution of values and corresponding index, data from normal tissue is used to determine a distribution of values and a corresponding index for normal tissue and data from abnormal tissue is used to determine a distribution of values and a corresponding index for abnormal tissue.
21. The method of claim 18, wherein the given plurality of tissue types includes at least one type selected from the group consisting of skin, liver, kidney, muscle, brain and pancreas.

22. A computer implemented method for classifying user-supplied tissue specimens, the method comprising:

- (A) obtaining tissue specimens for a plurality of tissue types from a subset of a population of subjects with shared characteristics,
- (B) analyzing each of the tissue specimens,
- (C) determining for each tissue type from the analysis in (B) a distribution of values for calculating an average of each of a plurality of mechanical indices, wherein the given plurality of mechanical indices includes at least one selected from the group consisting of modulus of elasticity and mechanical strength;
- (D) calculating the average mechanical indices for the determined distribution of values;
- (E) storing the average mechanical indices in a database;
- (F) applying steps B-D to measure average mechanical indices for the user supplied tissue specimens; and
- (G) classifying each of the user-supplied tissue specimens as either normal or abnormal by comparing the measured average mechanical indices associated with the user-supplied tissue specimens with the corresponding indices stored in the database, wherein the user-supplied tissue specimens are classified as abnormal to the extent that there is a statistically significant deviation of the measured mechanical indices from the indices stored in the database,

wherein the number of tissue specimens in (A) includes a sufficient number of specimens such that the indices correspond to a statistically significant representation of those indices for the population as a whole.

23. The method of claim 22, wherein the tissue specimens comprise normal tissue.

24. The method of claim 22, wherein the tissue specimens comprise abnormal tissue.

25. The method of claim 22, wherein the tissue specimens comprise normal and abnormal tissue of the same tissue type, and  
wherein in the determination of distribution of values and corresponding index, data from normal tissue is used to determine a distribution of values and a corresponding index for normal tissue

and data from abnormal tissue is used to determine a distribution of values and a corresponding index for abnormal tissue.

26. The method of claim 22, wherein the given plurality of tissue types includes at least one type selected from the group consisting of skin, liver, kidney, muscle, brain and pancreas.

27. A computer implemented method for assessing normalcy of user-supplied tissue specimens, the method comprising:

- (A) obtaining tissue specimens for a plurality of tissue types from a subset of a population of subjects with shared characteristics;
- (B) imaging each of the tissue specimens;
- (C) determining for each tissue type from the imaging in (B) a distribution of values for calculating an average of each of a plurality of structural indices, wherein the plurality of structural indices includes at least one selected from the group consisting of: cell density, matrix density, blood vessel density, layer thickness, relative cell location, relative matrix location and relative blood vessel location;
- (D) calculating the average structural indices for the determined distribution of values;
- (E) calculating dispersion indices for each of the average indices in (D);
- (F) storing the average of each of a plurality structural indices and dispersion indices in a database;
- (G) applying steps B-D to measure average structural indices for the user supplied tissue specimens; and
- (H) assessing the normalcy of each of the user-supplied tissue specimens by comparing the measured structural indices associated with the user-supplied tissue specimens with the corresponding indices stored in the database.

wherein the number of tissue specimens in (A) includes a sufficient number of specimens such that the indices correspond to a statistically significant representation of those indices for the population as a whole.

28. The method of claim 27, wherein in step (H) the user-supplied tissue specimens are

classified as abnormal to the extent that there is a statistically significant deviation of the measured indices from the indices stored in the database.

29. A computer implemented method for assessing normalcy of user-supplied tissue specimens, the method comprising:

- (A) obtaining tissue specimens for a plurality of tissue types from a subset of a population of subjects with shared characteristics;
- (B) analyzing each of the tissue specimens;
- (C) determining for each tissue type from the analysis in (B) a distribution of values for calculating an average of each of a plurality of cell function indices, wherein the given plurality of cell function indices includes at least one selected from the group consisting of: location, type and amount of DNA; location, type and amount of mRNA; location, type and amount of cellular proteins; location, type and amount of cellular lipids; and location, type and amount of cellular ion distributions;
- (D) calculating the average cell function indices for the determined distribution of values;
- (E) storing the average cell function indices in a database;
- (F) applying steps B-D to measure average cell function indices for the user supplied tissue specimens; and
- (G) assessing the normalcy of the user-supplied tissue specimens by comparing the measured cell function indices associated with the user-supplied tissue specimens with the corresponding cell function indices stored in the database,

wherein the number of tissue specimens in (A) includes a sufficient number of specimens such that the indices correspond to a statistically significant representation of those indices for the population as a whole.

30. The method of claim 29, wherein in step (H) the user-supplied tissue specimens are classified as abnormal to the extent that there is a statistically significant deviation of the measured cell function indices from the cell function indices stored in the database.

31. A computer implemented method for assessing normalcy of user-supplied tissue

specimens, the method comprising:

- (A) obtaining tissue specimens for a plurality of tissue types from a subset of a population of subjects with shared characteristics,
- (B) analyzing each of the tissue specimens,
- (C) determining for each tissue type from the analysis in (B) a distribution of values for calculating an average of each of a plurality of mechanical indices, wherein the given plurality of mechanical indices includes at least one selected from the group consisting of modulus of elasticity and mechanical strength;
- (D) calculating the average mechanical indices for the determined distribution of values;
- (E) storing the average mechanical indices in a database;
- (F) applying steps B-D to measure average mechanical indices for the user supplied tissue specimens; and
- (G) assessing the normalcy of each of the user-supplied tissue specimens by comparing the measured average mechanical indices associated with the user-supplied tissue specimens with the corresponding indices stored in the database,

wherein the number of tissue specimens in (A) includes a sufficient number of specimens such that the indices correspond to a statistically significant representation of those indices for the population as a whole.

32. The method of claim 31, wherein in step (H) the user-supplied tissue specimens are classified as abnormal to the extent that there is a statistically significant deviation of the measured mechanical indices from the indices stored in the database.

33. A computer program product embodied in one or more computer-readable storage mediums and for classifying user-supplied tissue specimens, the computer program product comprising:

code for generating values corresponding to a sample of tissue specimens of a given tissue type to generate values for each of said tissue specimens in the sample, wherein the given tissue type corresponds to a population of subjects having at least one shared characteristic;

code for determining at least one index for each of said tissue specimens using said



values, wherein each said at least one index corresponds to a statistically significant representation of said values from which it is determined;

code for storing said determined indices; and,

code for providing access to said stored indices so as to allow said at least one user to obtain said information representative of a plurality of tissue types.

34. A computer program product embodied in one or more computer-readable storage mediums and for classifying user-supplied tissue specimens, the computer program product comprising:

code for generating values corresponding to a sample of tissue specimens of a given tissue type to generate values for each of said tissue specimens in the sample, wherein the given tissue type corresponds to a population of subjects having at least one shared characteristic;

code for calculating a plurality of indices for each of said tissue specimens using said values, wherein each said at least one index corresponds to a statistically significant representation of said values from which it is determined;

code for storing said calculated indices; and

code for providing access to said stored indices so as to allow said at least one user to obtain said information representative of a plurality of tissue types.